# *G30x-L GPS Data Logger Receiver*

**Embedded Solutions**

## MightyGPS Technology, Inc.

http://www.mightygps.com

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# 1. Introduction

The G30-L Compact GPS receiver ( data logger ) is about the half size of a computer mouse. Based on the SiRF star II ™ chip set manufactured by SiRF Technology, Inc., G30-L supports all features, and maintains the technical specifications of the SiRF star II ™ architecture.

G30-L receiver is a fully self-contained receiver for the Global Positioning System with data logger capabilities. Inside the container, the TF30 module provides complete GPS signal processing from antenna input to serial data output. The module connects seamlessly to low cost active antenna. Moreover, G30-L is also a mini data logger (up to 15hrs for PVT data, 1Hz update rate) by using SiRF GSP2e integrated ARM7TDMI™ microprocessor and on-board flash memory.

Two versions of G30x are available. G30R comes with a 9-pin serial connector, and G30U comes with a USB connector. Also both modules can come with (G30R-L, G30U-L) or without (G30R, G30U) data logger function.
These receivers are well suited to system integrators or users who use popular PC compatible system, notebook PC, PDA and “off-the-shelf” GPS solution.

G30 can be used as an ordinary real-time GPS locator, and in the mean time to log the GPS data to its on-board flash memory. The type of data to be logged as well as the data format can be specified by the user in the logging setup. The log rate is also user definable. When any of these are activated, the character string is written to the log file along with the GPS data. A companion software package provides above functions and replays these markers.

G30 can satisfy a wide variety of application for vehicle navigation, tracking or leisure purpose. In automotive applications, the SiRF architecture supports advanced tracking capabilities through fast recovery times combined with reliable operation in “urban” and areas of dense foliage.

# 1.1 Specification

G30 Compact GPS Receiver Specifications

| General | G30R /G30R-L | G30U /G30U-L |
|---|---|---|
| GPS Receiver | 12 Channel “All-in-view” tracking | 12 Channel “All-in-view” tracking |
| Cable Connections | Terminated DB-9 serial connector | Terminated USB serial connector, 12 ft. cable. |
| Mounting | Magnetic mount. | Magnetic mount. |
| **Performance** | | |
| Position Accuracy | 25 meters CEP without SA | 25 meters CEP without SA |
| Velocity Accuracy | 0.1 meters/second, without SA | 0.1 meters/second, without SA |
| Max Speed | 515 meters/sec.(1000 Knots) max. | 515 meters/sec.(1000 Knots) max. |
| Acceleration | 4 g., max. | 4 g., max. |
| Jerk | 20 meters /sec.$^3$ max. | 20 meters /sec.$^3$ max. |
| Max Altitude | 18,000 meters (60,000 Feet) max. | 18,000 meters (60,000 Feet) max. |
| Time to First Fix | 45 sec (Cold Start)<br>38 sec (Warm Start)<br>8 sec (Hot start)<br>0.1 sec (Reacquisition) | 45 sec (Cold Start)<br>38 sec (Warm Start)<br>8 sec (Hot start)<br>0.1 sec (Reacquisition) |
| Update Rate | 1/sec | 1/sec |
| Receiver Sensitivity | -175dBW | -175dBW |
| Map Datum | WGS-84 | WGS-84 |
| Data Logger | 16M bit (up to 15hrs for PVT data, 1Hz update rate) (G30R-L only) | 16M bit (up to 15hrs for PVT data, 1Hz update rate) (G30U-L only) |
| **Interfaces** | | |
| Input Voltage | +5V DC | +5V DC |
| Power Cons.(Avg.) | 0.3 watt | 0.3 watt |
| Serial Comm. | Hardware/ software baud rates: 4800 baud (default) | Hardware/ software baud rates: 4800 baud (default) |
| Protocol Messages | NMEA 0183 v2.2<br>SiRF Binary | NMEA 0183 v2.2<br>SiRF Binary |
| **Physical** | Compact, integrated GPS receiver and antenna | Compact, integrated GPS receiver and antenna |
| Dimensions | 66 x 50 x 25.5 | 66 x 50 x 25.5 |
| Weight | 85g | 85g |
| Operating Temp | -10°C to +70°C | -10°C to +70°C |
| Storage Temp | -40°C to +85°C | -40°C to +85°C |

*Specifications are subjected to change without notice*

# 2. Installation

## 2.1 Connecting G30 (For G30R/G30R-L, PS/2 type )

Step1. Plug RS-232 to COM port of your Notebook PC or Handheld PC.

Step2. Plug PS2 connector in the PS2 mouse outlet of your Laptop PC or Handheld PC.

Place your PC in a safe and plane surface inside the vehicle.

Step3. Place your G30 on the outside roof of your vehicle with magnetic base.

Step4. Choose the correct COM port for running the map or navigation software.

Step5. Run the SiRF DEMO program. Please refer to **"SiRF Demo user manual"**.

Notice:

(1) Make sure the power is off before the start.

(2) For safety reason, please do not install G30 while driving.

(3) To receive NMEA0183 navigational data, use the Hyper Terminal program of Windows 98/ME/2000. Please setup the COM port connected with G30R / G30R-L to:

**Baud rate : 4800**

**Data bit : 8**

**Parity : None**

**Stop bit : 1**

**Flow control : None.**

(4) The format of NMEA messages is illustrated on Software Data section.

(5) To prevent from the poor contact, the 4-pin mini din connector was designed as good fitting. It is strongly recommended that users don't plug & unplug this connector frequently.

## 2.2 Connecting G30 (For G30U/G30U-L, USB type)

Step1. Run the program "USBDRV.exe" to unzip it. You will find the "serwpl.inf" file in the \PL-2303 directory.

Step2. Connect G30U/G30U-L to the USB port of your computer. The devices will be detected automatically. Please follow the installation procedure until the system asks you to locate the driver file. Please point out the directory \PL-2303 in Step1.

Step3. To check where the "COM" port is for the USB device, please open "Control Panel", click on "System", choose "Devices Manager", and then check the Port (COM&LPT) . It should have a "USB to Serial Port " there. Look at which COM port is.

Step4. User's application can access the G30U via the "COM" port found in Step 3. The

COM port is for the setup of SiRF demo program(SIRFDEMO.exe) and some mapping software which supports GPS function. For instance, if it shows COM3, you have to switch to the COM port when you start SiRF demo program. Please notice the action, it is very important. If you don't setup the right Com port, no matter SiRF demo program or other mapping software, it will be unable to communicate with your computer.

Step5. Place your G30 on the outside roof of your vehicle with magnetic base.

Notice:

(1) Uninstall:
Run the program "DRemover98_2k.exe" to uninstall the dirvers.

(2) To receive NMEA0183 navigational data, please use the Hyper Terminal program of Windows 98/ME/2000. Please setup the virtual COM port connected with G30U / G30U-L to:
**Baud rate : 4800**
**Data bit : 8**
**Parity : None**
**Stop bit : 1**
**Flow control : None.**

(3) The formats of NMEA messages are illustrated on Software Data section.

(4) To prevent from the poor contact, the USB connector was designed as good fitting. It is strongly hot plug and play this connector frequently.

# 3 Using Data Logger Demo Program

**GPS Data Logger** demo program is a Win98/Win2000 based application software to demo and test functions of **G10/G30**. This demo software will, according to the configuration, start recording upon power on and stop recording on running out of storage. Users may use the demo program to:

- Upload recorded data
- Change Recording Interval
- Change Recording Mode
- Programmable Device ID
- Clear recorded data
- Upgrade Firmware

## 3.1 Getting Connected

First, connect G30-L to the USB/RS232 slot of your PC. Launch demo program and use “select comport” button (first speed button) to select the correct COM port connected. When COM port is correct selected, then press “connect” speed button to connect G30-L. Once connected, all the other disabled buttons will become enabled. (see Fig. 1) The connected device “G30-L” is shown in the message area. The connecting result is shown in the status area. Sometimes users may need to retry if the connection failed.

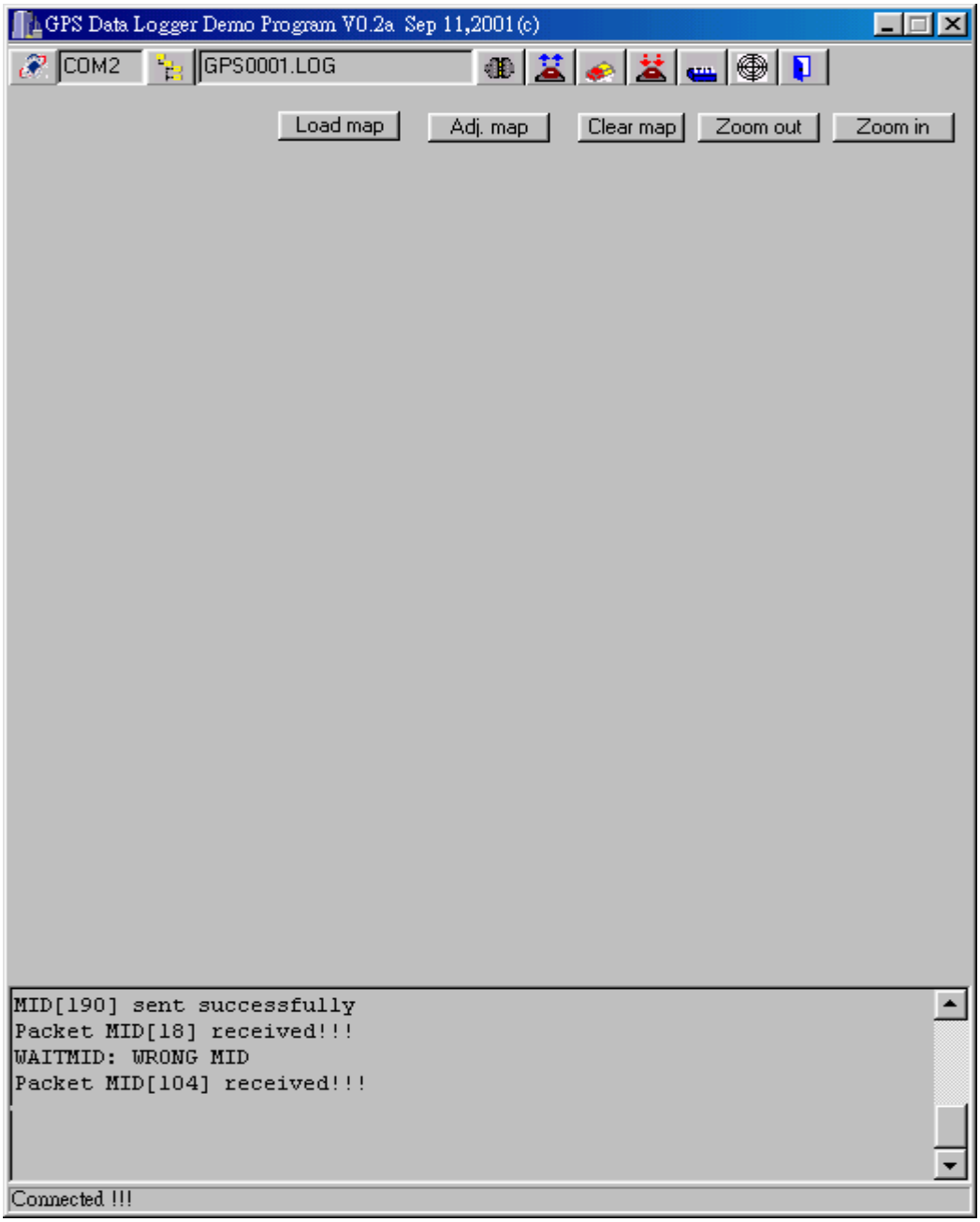


Fig 1 Device connected

## 3.2 Uploading Data

Use “data sync” speed button to upload record. Users need to specify a file to save the uploaded data. A blue bar will display to indicate the upload progressing. Use “erase” speed button to clear logged data. After uploading the recorded data, users need to “erase” the storage of the device to enable the device to record new data again.

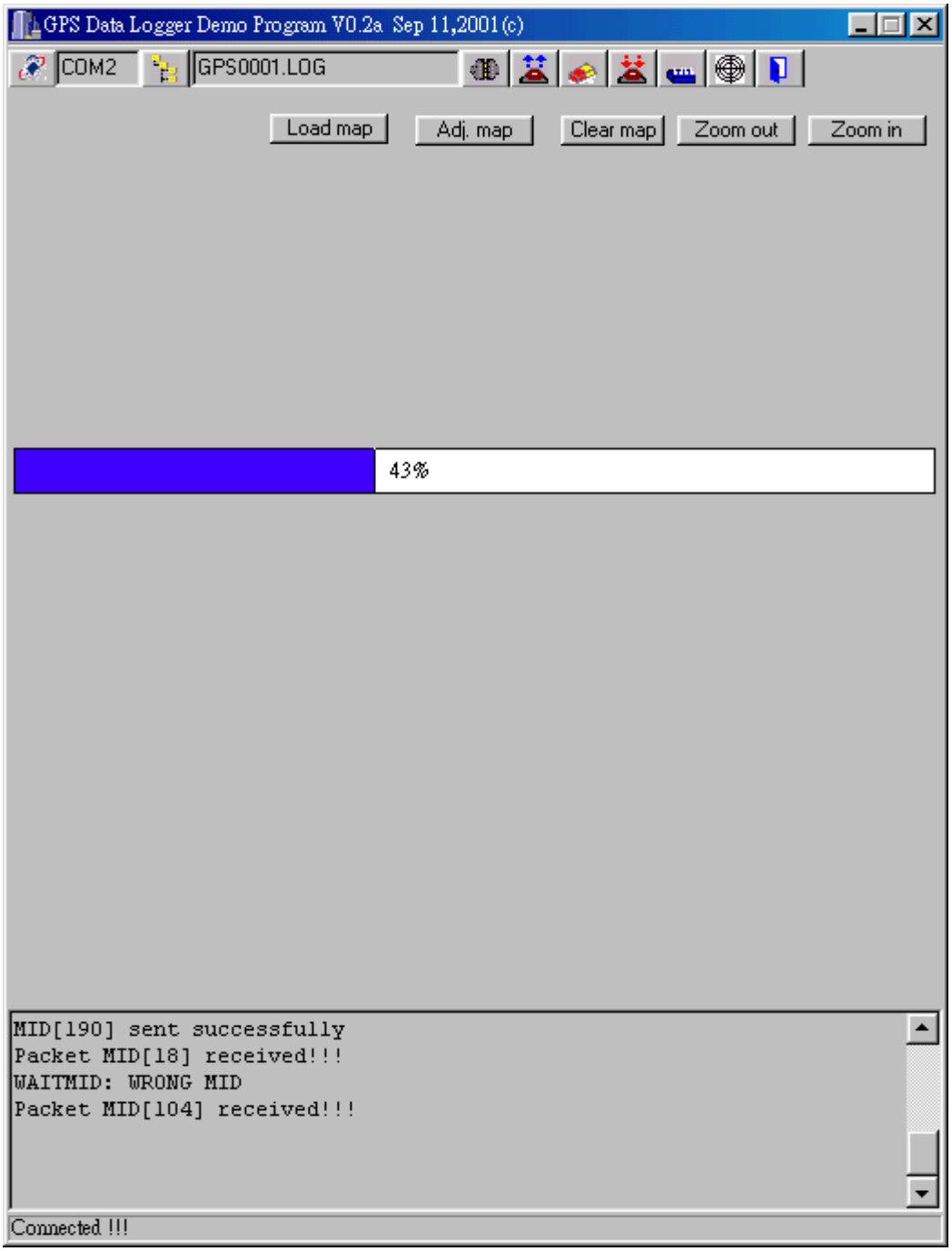


Fig 2 Uploading recorded data

## 3.3 Data Review

Use “analysis”speed button to read back and display recorded data. (see Fig 4)

Some summary data is shown in the message area.

The diameter of the yellow circle is 20 meters.

The diameter of the green circle is 100 meters

Fig 4 Record data

Use “Load map” button to load a map file (in BMP format) as a back map. (see Fig 5)
The loaded map file will automatically fit into the current display range.

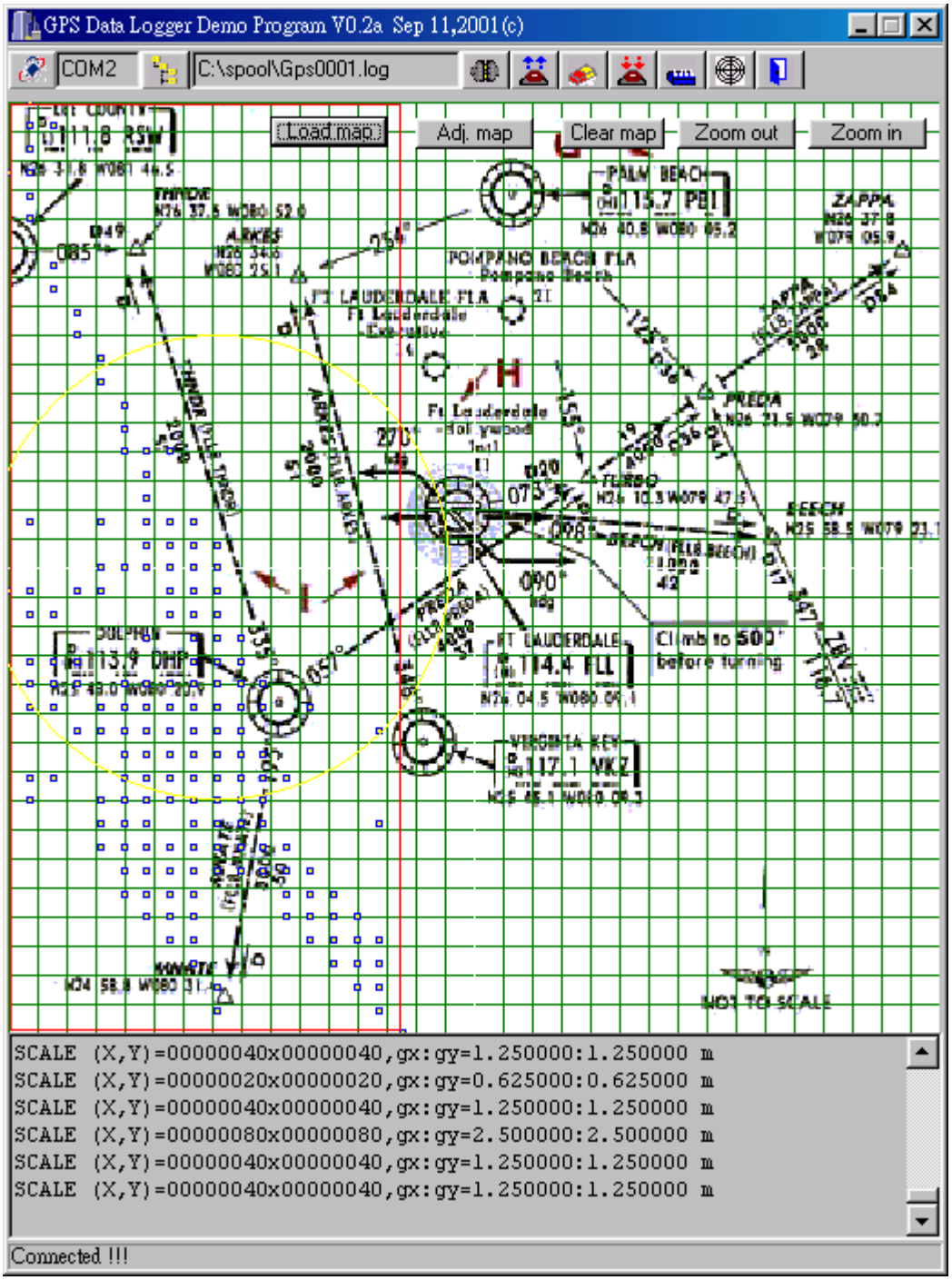


Fig 5 Background map loaded

Users can use “Adj. Map” button to set the correct map range in WGS84 (see fig 6) Use “Clear map”button to remove the background map. Use “Zoom In” “Zoom Out” buttons to change view range.

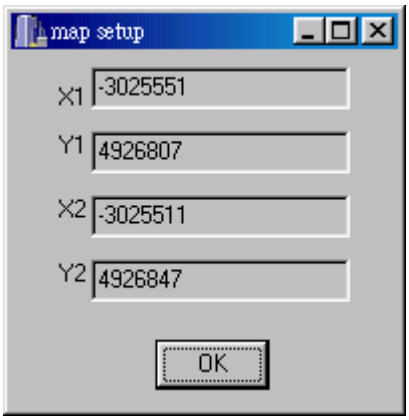


Fig 6 Adjust the map range

# 4 Troubleshooting

| Problem | Reason | Solution |
|---|---|---|
| Test fail (No serial port output ) | 1.Poor connection<br>2.SiRF Demo set on wrong configuration. | 1.Check the RS-232 and PS/2 connector or USB connector to make sure they are well connected.<br>2. Check SiRF demo set on correct COM port and baud rate. |
| Open COM port fail | The serial COM port has been used for other application program | 1.Close all the other application programs and return to the SiRF Demo.<br>2.If the problem still happen. Restart the computer and run the SiRF Demo again. |
| No position output but timer is counting | 1.Weak or no GPS signal can be received by G30<br>2.At outdoor space but GPS signal is block by building. | 1.Go outdoor place without high building to block the signal. |